

6000

The letters 'VAX' are rendered in a large, bold, sans-serif font. The letters are dark gray with a slightly textured appearance, possibly due to the scanning process. They are positioned diagonally across the page, with the 'V' at the bottom left and the 'X' at the top right. The background is a light gray with a fine, uniform grid pattern.[illegible]

# **VAX 6000 Model 200/300/400 Processor Console and Diagnostic ROM Upgrade Instructions**

**Revision/Update Information:**    Revision: V1.6, October 10, 1990

These instructions are for Digital customer service representatives and self-maintenance customers. The instructions describe how to upgrade the processor module's console and diagnostic ROMS.

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Digital Equipment Corporation  
Maynard, Massachusetts

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# CHAPTER 1

## ROM UPGRADE OVERVIEW

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VAX 6000 Model 200/300/400 processor's console and diagnostic ROMs have to be replaced to support the new MS65A memory. The ROMs must be replaced on all processor modules in the system. The new ROMs also incorporate support for other new bus devices including:

- DEMNA, XMI Bus Ethernet Adapter
- KDM70, XMI Bus DSA Disk Controller
- DWMBB, Enhanced XMI-to-VAXBI Bus Adapter
- CIXCD, XMI Bus CI Adapter
- InfoServer 100, Ethernet CD ROM Server

Another change introduced along with the new ROMs is a new level 3 VAX Diagnostic Supervisor program called EVUCA an EEPROM update utility. This program provides more functionality for updating all VAX 6000 processor's EEPROM than the console UPDATE command. Once the ROMs have been upgraded, it is highly recommended to use this program rather than the UPDATE command. Refer to Appendix A for more information on this program.

### 1.1 VAX 6000 200/300/400 Console Rom XMI Device Support

Use Table 1 to determine the necessary console ROM revision level to support each new device. Some devices only require patches to the existing console ROM. The current console ROM/EEPROM revision can be determined by examining the console display printed during initialization. If a PATCH is all that is required, refer to Appendix A for information on using *EVUCA*, *VAX 6000 Series EEPROM Utility Program* to install the patch.

**Table 1: VAX 6000 Console Patch/ROM Device Support Table**

ROM Revision	VAX 6000-200		VAX 6000-300		VAX 6000-400		
	V3.1	V5.0	V4.1	V6.0	V1.0	V2.0	V3.0
CIXCD	patch 3 8	yes	patch-4 6	yes	no	patch-2.01	yes
DEMNA	patch-3 7	yes	patch-4 5	yes	patch-1.02	yes	yes
DWMBB	no	yes	no	yes	no	no	yes
KDM70	patch 3 6	yes	patch-4 4	yes	patch-1.02	yes	yes
MS65A	no	yes	no	yes	no	no	yes
InfoServer	patch 3 8 <sup>1</sup>	yes	patch-4 6 <sup>1</sup>	yes	no	yes	yes

<sup>1</sup> This patch can not be distributed by CD ROM when it is needed to support this device.

**KEY**

Yes — Support is in ROM

No — Support not available

Patch — Support can be patched in EEPROM minimum EEPROM Revision for support listed

**1.2 Quick-Check to Determine Applicability**

To determine the presence of the new ROMs, check the processor's console ROM for the following part number or the console display (printed during initialization) for the following ROM revision.

See Chapter 2, Figure 1 or 2 depending on model for location of the console ROM.

**Table 2: ROM Upgrade Quick-Check Chart**

Model	Processor	Module	Quick Check	ROM Revision
200	KA62A-AA	T2011-00	E16, Console ROM 23-186E9-00	V5.0
300	KA62B-AA	T2011-YA	E16, Console ROM 23-188E9-00	V6.0
	KA62B-AB	T2011-YC	E16, Console ROM 23-192E9-00	V6.0
400	KA64A-AA	T2015-00	E97, Console ROM 23-190E9-00	V3.0
	KA64A-AB	T2015-YA	E97, Console ROM 23-194E9-00	V3.0

**1.3 VAX 6000 Upgrade Applicability**

These instructions apply to the following VAX 6000 models at the listed revisions.

**Table 3: VAX 6000 Systems**

Model	Type	Processor	Module	Current Revisions
200	Timeshare	KA62A-AA	T2011-00	J01, J02, J03 K01, K02, K03
	Server	KA62A-AB	T2011-YB	Not Supported
300	Timeshare	KA62B-AA	T2011-YA	B01, C01, D01, E01
	Server	KA62B-AB	T2011-YC	A01, B01, C01, D01
400	Timeshare	KA64A-AA	T2015	H03, H04, H05 J03, J04, J05 K03, K04, K05
				L03, L04, L05
				A01, B01, C01, D01
	Server	KA64A-AB	T2015-YA	A01, B01, C01, D01

## 1.4 Engineering Change Orders Implemented

These instructions pertain to the installation of the following VAX 6000 Systems ECOs.

- Model 200, T2011-00-ECO009
- Model 300, T2011-YA-ECO003
- Model 400, T2015-00-ECO009, 010

## 1.5 ROM Upgrade Procedure Information

Updating VAX 6000 processor ROMs requires several steps that must be followed **EXACTLY AND IN ORDER**. Failure to follow the steps can lead to delays and even having to replace the EEPROM on the CPU board.

These instructions assume your VAX 6000 system includes no failing processor boards. If a board fails self-test during this process and the problem can't be corrected, you should remove that processor board from the upgrade process.

There are some commands that you may not be familiar with in this procedure. These commands like **[ESC] [DEL] SET MANUFACTURING** are used in manufacturing to place the module serial and revision information in the EEPROM. Another is the **JSB** instruction which jumps to execute code in the console ROM that programs the EEPROM with a default image.

### CAUTION

**Main memory can not have any bad arrays to successfully clear the processor's EEPROM.**

To update the VAX 6000 processor boards you have to do several tasks. You must record information stored in the EEPROM of each processor. Some of this information, like stored boot specifications and the system serial number, is the same on each processor. You can display this information from one processor; you do not have to select each processor and display the information. Likewise, when you enter the boot specifications after the ROMs have been installed, you need only do this from one processor, because the **SET BOOT** command causes the boot specification you enter to be copied to all processors.



Other information, like manufacturing information, is different on each processor, and you must select each processor in turn using the SET CPU command, to display and record this information. Likewise, when you replace this information, you must select each processor and replace the information you recorded for that processor.

After recording this information, you have to disable the EEPROM of each processor. Disabling the EEPROM prevents the new console ROMs you install from using the old patch table in the EEPROM. Again, you must select each processor, using SET CPU, to disable the EEPROM.

#### **NOTE**

If your console is connected to VCS (VAX Cluster Console) and the VCS baud rate is not set to 1200 baud, you must either switch to a hardcopy console or return VCS to 1200 baud. (Switching to a hardcopy console line is probably preferable and easiest.) The reason for this is that the default console baud rate is 1200 baud. During the upgrade process, the system is powered up with disabled EEPROMs to prevent the new console from using the patch vector of the previous console. Since the EEPROM is disabled, the console will use the default baud rate (1200).



## CHAPTER 2

### CONSOLE AND DIAGNOSTIC ROM UPGRADE PROCEDURE

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Since this procedure requires recording several pieces of information, it is recommended to use a hardcopy printer.

#### NOTE

On VT100 series terminals replace **CTRL 3** with **ESC** in the steps below.

1. Have the customer shutdown the operating system using the approved method.

Example of a typical VMS shutdown session:

```
$ @sys$system:shutdown
```

**SHUTDOWN—Perform an Orderly System Shutdown on node PEEVEE**

How many minutes until final shutdown [0]:

Reason for shutdown [Standalone]:

Do you want to spin down the disk volumes [NO]?:

Do you want to invoke the site-specific shutdown procedure [YES]?:

Should an automatic system reboot be performed [NO]?:

When will the system be rebooted [later]:

Shutdown options (enter as a comma-separated list):

REMOVE\_NODE Remaining nodes in the cluster should adjust quorum

CLUSTER\_SHUTDOWN Entire cluster is shutting down

REBOOT\_CHECK Check existence of basic system files

SAVE\_FEEDBACK Save AUTOGEN feedback information from this boot

Shutdown options [NONE]: reboot

[VMS will issue several messages indicating it is shutting down. Then VMS will issue]:

**SYSTEM SHUTDOWN COMPLETE - USE CONSOLE TO HALT SYSTEM**

2. At this point type a **CTRL P** to halt the primary processor.
3. Enter **INITIALIZE** at the **>>>** prompt (see Example 1). This resets the system and forces all processors into console mode.

- Examine the console display to determine the location of each processor in the system. Record the location of each processor. The letter P on the TYP line indicates a processor node. Example 1 shows the output from a Model 440 system.

#### Example 1: Typical VAX 6000 Console Display

```
>>> INIT
#123456789 0123456789 0123456789 01234567#

F  E  D  C  B  A  9  8  7  6  5  4  3  2  1  G  NODE #
    A  A  .  .  M  M  M  M  .  .  P  P  P  P      TYP
    O  O  .  .  +  +  +  +  .  .  +  +  +  +      STF
    .  .  .  .  .  .  .  .  .  .  E  E  E  B      BPD
    .  .  .  .  .  .  .  .  .  .  +  +  +  +      ETF
    .  .  .  .  .  .  .  .  .  .  E  E  E  B      BFD

.  .  .  .  .  .  .  .  +  .  +  .  .  +  .  XBI D +
.  .  .  .  .  .  .  .  +  .  +  .  .  +  .  XBI E +
.  .  .  .  .  A4 A3 A2 A1 .  .  .  .  .  .  ILV
.  .  .  .  .  32 32 32 32 .  .  .  .  .  .  128 Mb
ROM0 = V1.00  ROM1 = V1.00  EEPROM = 1.00/1.00  SN = SG1234567
```

#### NOTE

Before executing the next step, read the note about VAX CLUSTER console in the introduction to these instructions.

- Set the control panel lower key switch to the UPDATE position to enable writing to the EEPROM.

#### NOTE

When you install the new ROMs, the console baud rate will be set to 1200. The following two steps ensure that this condition is set-up prior to replacing the ROMs.

- Enter the following command to ensure that the console baud rate is set to 1200.

```
>>> SET TERMINAL/SPEED:1200
```

- Set the baud rate of the console terminal to 1200 baud and make it the permanent setting. Refer to the terminal's user/owner guide for instructions on how this is done.
- Type the SHOW ALL command and record all parameters, specifically, the /NOPRIMARY, the /INTERLEAVE, the /SCOPE, the /SPEED, the /BREAK, and the boot specifications. Example 2 shows the latter part of the command output:

## Example 2: SHOW ALL Command Output

>>> SHOW ALL

```
.
.
.
Current Primary 1
/NOENABLE,                !All CPUs are enabled
/NOVECTOR ENABLED-
/NOPRIMARY, 2, 4          !CPUs at nodes 2 and 4 cannot be primaries

F  E  D  C  B  A  9  8  7  6  5  4  3  2  1  0  NODE #
.  .  .  .  .  A4 A3 A2 A1 .  .  .  .  .  .  ILV
.  .  .  .  .  32 32 32 32 .  .  .  .  .  .  128 Mb

/INTERLEAVE:DEFAULT
/SCOPE /SPEED: 1200 /BREAK ! Shows the terminal characteristics
English                    ! Shows the language mode
XMI:D BI:6 08-00-2B-08-3D-64 ! Shows the Ethernet address
DEFAULT /XMI:E /BI:4 DU3D   ! Shows the Boot specifications
R54A    /R5:00000001/XMI:E/BI:4 DU4A
DIAG    /R5:00000010/XMI:E/BI:4 DU15
R5       /R5:00000001/XMI:E/BI:4 DUD
```

### NOTE

The following steps are used to connect the console terminal to each processor in the system beginning with the processor at the lowest node and progressing to the highest.

9. From the console display in Step 4 determine which nodes contain processors. Then connect the terminal to the processor at the lowest node by entering:

>>> SET CPU *n* /where *n* is the XMI node number

10. Enter a **CTRL 3** **DEL** SHOW SYSTEM SERIAL command and record the system serial number. Here is a sample of the command output:

>>> \$^?SHOW SYSTEM SERIAL

System serial number: AG83701988

11. Enter the **CTRL 3** **DEL** SHOW MANUFACTURING command and record the module serial number and revision of the current processor board. Make sure you match this information with the number of the processor you are currently set to. When you clear the EEPROM, this information is lost and must be entered manually into each module's EEPROM. Currently the last three fields in the manufacturing area are not used. The example below is from a Model 400, there could be a slight variation from it depending on the VAX 6000 Model.

The sample output from a Model 400 System follows:

>>> \$^?SHOW MANUFACTURING

Manufacturing parameters are as follows:

Module serial number: NI84800046

Module revision: J03

REX520 revision

FPU revision:

RSSC revision:

12. Deposit a zero into the EEPROM header to disable console patches by entering the following instruction:

>>>D/U 20080000 0

13. If the system has only one processor board, go to Step 16.
14. Enter SET CPU  $n$  /where  $n$  equals the XMI node number of the next processor.
15. Repeat Steps 11, 12, and 14 until you have recorded the manufacturing parameters and deposited a zero into 20080000 (disabled the console patches) for each processor in your system.
16. Power down the system by setting the upper key switch to the Off position.

#### CAUTION

All VAX modules contain electrostatic discharge sensitive devices (ESDS). The use of the VELOSTAT kit is essential to prevent damage that may not be noticed immediately.

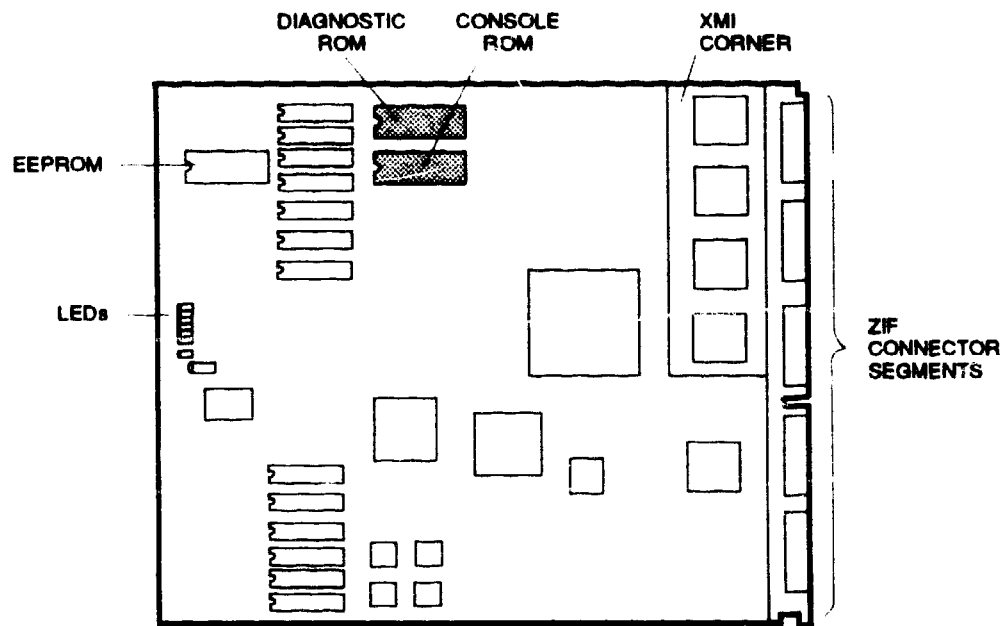
17. Setup the VELOSTAT KIT
  - a. Unfold the VELOSTAT mat to full size (24" x 24").
  - b. Attach the 15 foot ground cord to the VELOSTAT snap fastener on the mat.
  - c. Attach the alligator clip end of the ground cord to a good ground on the system.
  - d. Attach the wrist strap to either wrist and the alligator clip to a convenient portion of the mat.
18. Remove a processor module from the card cage, handling it properly as you place it on the mat. Refer to Table 4 for the appropriate new ROM part number and Figure 1 or 2 for the location of the ROMs depending on model of processor.
  - a. Remove the old diagnostic ROM and replace it with the new diagnostic ROM, being careful to align the chip leads before inserting the ROM into the socket.
  - b. Remove the old console ROM and replace it with the new console ROM, being careful to align the chip leads before inserting the ROM into the socket.

Be sure that the ROM is placed in the socket correctly with no bent pins.

**Table 4: Processor Module's New ROM Part Numbers**

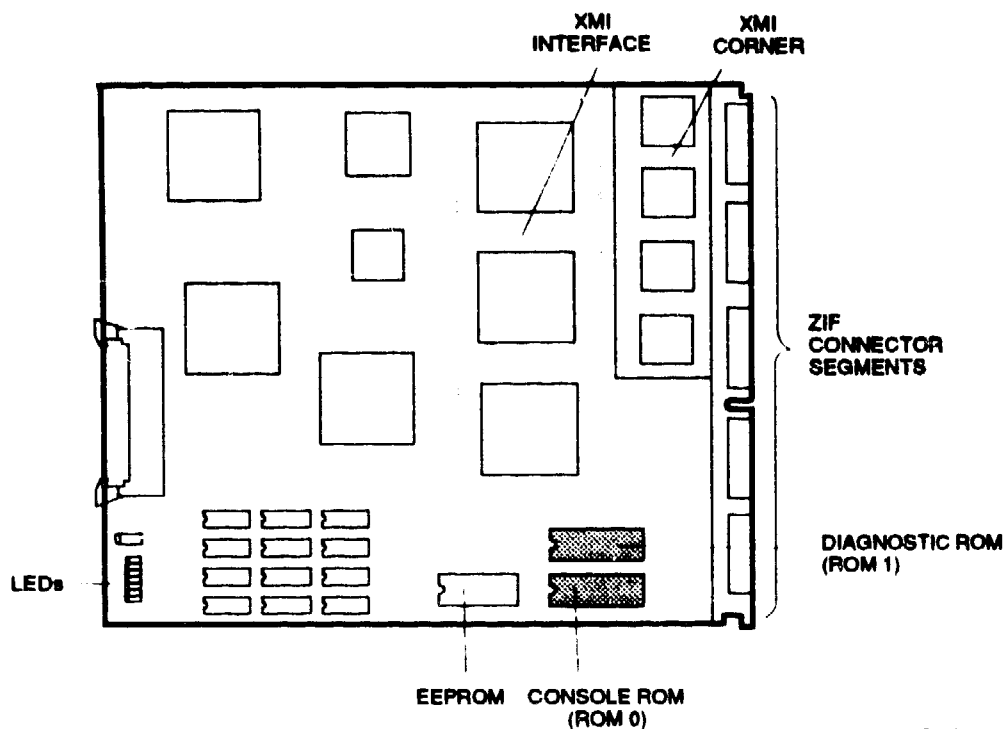
Processor	Module	Loc	Console ROM	Loc	Diagnostic ROM
KA62A-AA	T2011-00	E16	23-186E9-00	E08	23-187E9-00
KA62B-AA	T2011-YA	E16	23-188E9-00	E08	23-189E9-00
KA62B-AB	T2011-YC	E16	23-192E9-00	E08	23-189E9-00
KA64A-AA	T2015-00	E97	23-190E9-00	E77	23-191E9-00
KA64A-AB	T2015-YA	E97	23-194E9-00	E77	23-191E9-00

**Figure 1: KA62A and KA62B Processor Layout (T2011 Module)**



mab-0134B-90

**Figure 2: KA64A Processor Layout (T2015 Module)**



19. Fill out the new module revision label according to Table 5 and place it over the existing revision label on the module.

**Table 5: Processor Module Revision Chart**

System	Module	Old Revision	New Revision, Respectively
KA62A-AA	T2011-00	J01, J02, J03	AJ01, AJ02, AJ03
		K01, K02, K03	AK01, AK02, AK03
KA62B-AA	T2011-YA	B01, C01, D01, E01	AB01, AC01, AD01, AE01
KA62B-AB	T2011-YC	A01, B01, C01, D01	AA01, AB01, AC01, AD01
KA64A-AA	T2015-00	H03, H04, H05	AJ03, AJ04, AJ05
		J03, J04, J05	AJ03, AJ04, AJ05
		K03, K04, K05	AK03, AK04, AK05
		L03, L04, L05	AL03, AL04, AL05
KA64A-AB	T2015-YA	A01, B01, C01, D01	AB01, AB01, AC01, AD01

20. Replace the module back in its original slot in the card cage.
21. Repeat Steps 18, 19, and 20 until you have installed ROMs and module revision labels on all processor boards in the system.
22. Power on the system, by setting the key switch to Enable. If any module fails self-test, check to see the processor modules are seated correctly in the backplane.



When all boards pass self-test, the boot processor issues several messages about its own corrupt EEPROM and unusable patches and similar messages for all secondary processors. This is expected.

#### NOTE

If after powering up and the console's terminal keyboard does not respond, issue a **CLEAR COMM** command under the terminal's Set-Up Mode to clear this condition.

#### CAUTION

Before executing Step 23, **MAKE SURE YOU MAKE NO TYPING MISTAKES.** If you use the **DELETE** key to correct a typing mistake, the EEPROM set-up program interprets the **DELETE** key as a character. It treats **CTRL/U** the same way. If you make a typing mistake, you will have to reset the system by pressing the **Restart** button on the front of the cabinet. **MAKE SURE** you use the **SET CPU** command to the processor module you were updating at the time you made the typing mistake.

23. The default EEPROM image is included in the ROMS and needs to be executed to program the EEPROM.

For Model 200/300, type: >>> JSB 20055000

For Model 400, type: >>> JSB 20055C00

The console will then display the following prompts. Answer as shown.

#### For Model 200/300

Source Addr: 20055400  
EEPROM Destination Address: 20080000  
Length: 8000  
EEPROM Size <8,32>: 32

#### For Model 400

Source Addr: 20056000

A row of asterisks (\*) are displayed on the console terminal as the EEPROM is programmed followed by a Halt Instruction. The process takes about 20 seconds.

24. To verify that the EEPROM is programmed correctly. Enter the **CTRL B [DEL] LKUPVER** command, (Look UP VERsion command) and check for a 81 as the first number of the output. If you see another number, like 53, repeat the previous step to reprogram the EEPROM. If you still do not see an 81, replace the EEPROM.
25. This step only applies to Model 400.

Enable RBD error logging by entering the following command:

>>> D/U/P/L 200800A0 F

26. Enter the **[CTRL 3] [DEL]** SET MANUFACTURING command and enter the module's serial number recorded in step 11 and the NEW REVISION based on the revision in Step 19. You can enter a carriage return for the remaining parameters. Following is a Model 400 sample output from the command. There will be a slight variation in the headings depending on the VAX 6000 model.

>>> \$^?SET MANUFACTURING

Module Serial Number>>> NI84800046

Module Revision>>> AJ03

REX520 Revision>>>

FPU Revision>>>

RSSC Revision>>>

Fields are as follows:

Module serial number: NI84800046

Module revision: AJ03

REX520 revision

FPU revision:

RSSC revision:

Update EEPROM? (Y or N) >>> Y

?71 Manufacturing parameters updated.

27. Enter the **[CTRL 3] [DEL]** SET SYSTEM SERIAL command, using the serial number you recorded in Step 10. Here is sample output from the command:

>>> \$^?SET SYSTEM SERIAL

System Serial Number>>> AG83701988

Serial number read as: AG83701988

Update EEPROM? (Y or N) >>> Y

?73 System serial number updated.

28. If the system has only one processor module, go to Step 30
29. Issue the SET CPU *n* command to step to the next CPU in the system and repeat Steps 23 through 27 until you have updated all processor boards in your system.
30. Now enter the boot specifications you saved in Step 8, using the SET BOOT command. Below is an example of using this command:

>>> SET BOOT DEFAULT /XMI:E/BI:4 DU3D

It may be helpful to check the boot specification you just entered. Enter the **SHOW BOOT** command to check the boot specification or specifications. If your system contains more than one processor, entering the **SET BOOT** command causes the boot specification to be copied to all processors, so this command does not need to be repeated on each processor.

31. In Step 8 you also recorded several parameters using the **SHOW ALL** command. In this step you need to use a series of **SET** commands to return the system to its original state. The following are examples.

To set the language:

```
>>>SET LANGUAGE INTERNATIONAL  
or  
>>>SET LANGUAGE ENGLISH
```

To prevent a CPU from being the primary processor:

```
>>>SET CPU 2 /NOPRIMARY
```

To set console terminal characteristics:

```
>>>SET TERM/SCOPE/SPEED:9600/BREAK
```

#### **NOTE**

**If you do issue a **SET TERMINAL** command to change the speed recorded in the EEPROM, you will need to change the baud rate of the terminal itself.**

32. Return the lower key switch from **UPDATE** to its previous position.
33. Now press Restart button or enter the **INITIALIZE** command. If the console displays no error messages concerning console patches, corrupt EEPROMs, or serial number mismatches, the ROM update is complete.
34. Boot the system.
35. Return the system back to the customer.
36. Update the *Site Management Guide* to reflect the new module revisions.

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## APPENDIX A

### VAX 6000 SERIES EEPROM UPDATE UTILITY PROGRAM

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This appendix describes the EVUCA program, the VAX 6000 EEPROM update utility. EVUCA allows you to:

- Update all VAX 6000 series processor's EEPROM contents.
- Load boot primitives
- Update systems with processors at different ROM revisions.

#### A.1 EVUCA Program Overview

EVUCA is a level 3 program that runs under the VAX Diagnostic Supervisor (VAX/DS). Table A-1 lists the processor-specific data files used to update the EEPROM contents. Each data file consists of the latest patch file for each major version of the PROM and all loadable boot primitives. EEPROMs are also updated on secondary processors if they are selected and attached under VAX/DS.

For more detailed information see ZZ-EVUCA-1.0, *VAX 6000 EEPROM Utility Listing*.

---

**Table 6: EEPROM Update Data Files**

---

Data File	Processor	Model Number
ELUCA.BIN	KA62A	200
ELUCB.BIN	KA62B	300
ERUCA.BIN	KA64A	400
EMUCA.BIN	KA65A	500

---

The following conditions must be met before running EVUCA:

- All processors and memory modules must pass self-test
- The console ROM and diagnostic ROM must be the same revision level on each processor module.

## A.2 Updating EEPROM Contents

Following example shows a sample EEPROM update of a Model 300 two-processor system. The boot processor is in slot 1 and the secondary processor is in slot 2 of an XMI card cage.

### Example 3: Updating EEPROM Contents

```
>>>Boot /xmi:n/R5:10 DUxx                !Boot Diagnostic Supervisor
DIAGNOSTIC SUPERVISOR. ZZ-ELSAA-14.0-2227 2-JAN-1990 00:00:00
DS>Load EVUCA
DS>ATTACH KA62B HUB KA0 1
DS>ATTACH KA62B HUB KA1 2
DS>Select All
DS>Set Trace
DS>Start
..Program: EVUCA - VAX 6000 EEPROM Update Utility, revision 1.0, 5 tests,
at 00:36:33.79.
Testing: KA0 KA1
Booting secondary CPU 02.
Test 2: Load data from media                !Load Binary File
Data file? <ELUCR.BIN>                      !Binary File for Model 300
Searching for data file...
Data file Loaded.
Looking for patch for CPU 01 - ROM 06.00 EEPROM 06.00.
No patch image was found for CPU 01 - ROM 06.00 EEPROM 06.00
Looking for patch for CPU 02 - ROM 04.10 EEPROM 04.10
Patch image is revision 04.60
Do you really want to apply this patch [(N), Yes] yes
Test 3: Determine Typecodes Updated        !Areas to be patched.
Test 4: Update EEPROM data
Getting selectable boot primitives for CPU 02, ROM 04.10
Secondary cpus are being updated, please wait a maximum of 20 seconds.
Updating CPU 02
Secondary CPU 02 Done.
Test 5: Show Boot primitives
No boot primitives found in EEPROM for CPU 01
Getting boot primitives from secondary cpu
Secondary CPU 02 Done.
EEPROM boot primitives for CPU 2 revision 04.60 are:
1      This boot primitive supports the following:
    -boot primitive designation CI
2      This boot primitive supports the following:
    -boot primitive designation DU
3      This boot primitive supports the following:
    -boot primitive designation ET
The primary cpu was not updated.             !Boot primitives contained in ROM
Secondary CPU 02 was successfully updated.
Current ROM and EEPROM revisions for each CPU are:
CPU 01 - ROM 06.00 EEPROM 06.00
CPU 02 - ROM 04.10 EEPROM 04.60
..End of run, 0 errors detected, pass count is 1,
time is 1-JAN-1990 00:38:21.48
DS>EXIT
***                                     !Done
```